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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,247	07/21/2003	Gurkanwal Sahota	990307C1	7330
23696 7590 02/12/2007 QUALCOMM INCORPORATED 5775 MOREHOUSE DR. SAN DIEGO, CA 92121			EXAMINER VUONG, QUOCHIE B	
			ART UNIT 2618	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			NOTIFICATION DATE	
3 MONTHS			02/12/2007	
			DELIVERY MODE	
			ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary

Application No.

10/624,247

Applicant(s)

SAHOTA ET AL.

Examiner

Quochien B. Vuong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-18, 21-29 and 32 is/are rejected.
- 7) ☒ Claim(s) 14, 19, 20, 30 and 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites "the digital data input is at least one of an analog inphase(I) and a quadrature (Q) baseband signal" which is not clear how a digital data being at least one of analog signals.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5, 7- 13, 15-17, and 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lippmann et al. (US 5,371,500) in view of Cook (US 4,894,864). Yasuda (US 5,963,158).

Regarding claim 1, Lippmann et al. disclose a device (figure 1) comprising: an interface circuit formed on a first integrated circuit (IC) (30) for generating a signal

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responsive to a reference signal (26, 28) and to a digital data input (32); and a circuit element (36) formed external of the first IC for generating an output signal on the basis of the signal from the first IC (column 2, line 32- column 3, line 26, and figure 1).

Although Lippmann et al. do not specifically teach the signal from the first IC is a differential current signal. However, it is well known in the art for generating a differential current signal responsive to a reference signal and to a digital data input as taught by Cook (column 2, line 48 – column 3, line 13, and figure 1). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the teaching of Cook for generating the differential current signal to the device of Lippmann et al. for providing an alternate signal form which serving the same function as providing the comparison result between the input and reference signals.

Regarding claims 2, 3 and 8, Lippmann et al. and Cook do not disclose the device is a quadrature transmitter or a CDMA telephone. However, examiner takes Official notice that a quadrature transmitter or CDMA telephone is well known in the art. Therefore, it would have been obvious to adapt the device of Lippmann et al. and Cook to the well known quadrature transmitter or CDMA telephone for converting the signal from digital to analog and vice versa, and providing the compact design to the quadrature transmitter or CDMA telephone.

Regarding claim 4, Lippmann et al. disclose the reference signal is generated by a reference circuit on at least one of a second IC or coupled to the second IC (see figure 1).

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Regarding claim 5, Lippmann et al. (figure 1) disclose a reference circuit (16) for generating the reference signal.

Regarding claim 7, Lippmann et al. and Cook do not disclose the digital data input is at least one of an inphase (I) and a quadrature (Q) baseband signal. However, examiner takes Official notice that a digital data input having at least one of an inphase and a quadrature baseband signal is well known in the art. Therefore, it would have been obvious to adapt the well known digital data input having at least one of an inphase and a quadrature baseband signal to the device of Lippmann et al. and Cook for processing baseband signal in a communication equipment.

Regarding claims 9 and 10, Lippmann et al. disclose the reference signal is a voltage related to a bandgap voltage (column 7, lines 29-36, and figure 9).

Regarding claims 11-13, if not inherent it would be obvious for the output signal of the device of Lippmann et al. and Cook is a current signal since the output signal is generated based on the different current signal, and alternately be a voltage signal by a simple current/voltage conversion and for the resistor is external to the first and second ICs or is incorporated onto the second IC depending on the design preference to reducing the manufacture cost and for compact design.

Regarding claims 15 and 16, since the first IC of Lippmann et al. is a digital circuitry, therefore, it would have been obvious for the data input comprises at least four bit digital data signal or an oversampled digital data signal to get a more accuracy of signal conversion.

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Regarding claim 17, Cook disclose the circuit element is a variable gain amplifier (VGA) (column 2, lines 24-25, and figure 1).

Regarding claim 22, Lippmann et al. disclose an analog circuit (IC) (figure 1) adapted for use in a communication device, and responsive to an input signal generated externally as a function of a reference signal and a digital data input, the analog IC being coupled to a reference circuit for generating the reference signal, and comprising a circuit element for generating an output signal on the basis of the differential current signal (column 2, line 32- column 3, line 26, and figure 1). Although Lippmann et al. do not specifically teach the input signal is a differential current input signal. However, it is well known in the art for generating a differential current input signal responsive to a reference signal as taught by Cook (column 2, line 48 – column 3, line 13, and figure 1). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the teaching of Cook for generating the differential current signal to the IC of Lippmann et al. for providing an alternate signal form which serving the same function as providing the comparison result between the input and reference signals.

Regarding claims 23 and 24, Lippmann et al. disclose the reference signal is a voltage related to a bandgap voltage (column 7, lines 29-36, and figure 9).

Regarding claims 25-27, if not inherent it would be obvious for the reference signal of the IC of Lippmann et al. and Cook is a current signal since the input differential current signal is a function of the reference signal signal, and the output can be either current or voltage signal by a simple current/voltage conversion and for the resistor is

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external to the analog IC or incorporated onto the analog IC depending on the design preference to reducing the manufacture cost and for compact design.

Regarding claim 28, Cook discloses the IC is a variable gain amplifier (VGA) (column 2, lines 24-25, and figure 1).

5. Claims 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lippmann et al. in view of Cook and further in view of Rosch et al. (US 5,274,702)

Regarding claim 6, the combination of Lippmann et al. and Cook discloses the circuitry as in claims 1-3. Lippmann et al. and Cook do not specifically disclose at least one capacitor coupled between the differential current signal. However, it is well known in the art that a differential current signal is coupled to at least capacitor as taught by Rosch et al. (column 9, lines 59-63, and figure 3). Therefore, it would have been obvious for one having ordinary skill in the art to adapt the capacitor of Rosch et al to the different current signal of Lippmann et al. and Cook for providing a transmit signal.

6. Claims 18, 21, 29, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lippmann et al. in view of Cook and further in view of Nakamura et al. (US 4,573,153).

Regarding claims 18 and 29, Lippmann et al. and Cook fail to disclose the circuit element is a modulator. However, Nakamura et al. teach a modulator as a circuit element (column 2, lines 16-40, and figure 1). Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to adapt the

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modulator of Nakamura et al. to the circuitry of Lippmann et al. and Cook for compensating data error.

Regarding claims 21 and 32, Lippmann et al., Cook, and Nakamura do not disclose the modulator performs direct up conversion. However, the examiner takes Official notice that it is well known in the art for a modulator to perform direct up conversion. Therefore, it would have been obvious to adapt the well known modulator to perform direct up conversion to the device of Lippmann et al., Cook, and Nakamura for compact design in up conversion circuitry.

Allowable Subject Matter

7. Claims 14, 19, 20, 30, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 14, Lippmann et al. and Cook disclose the device of claim 1 above. However, Lippmann et al., Cook, and the prior art of record fail to teach or fairly suggest the device above wherein the interface circuit includes a current mirror for generating at least two mirror paths using the reference signal and a switch array for decoding the digital data input and for directing current from selected ones of the mirror paths to generate the differential current signal.

Regarding claims 19, 20, 30, and 31, Lippmann et al., Cook, and Nakamura disclose the device and analog IC of claims 18 and 29 above, respectively. However, Lippmann et al., Cook, Nakamura, and the prior art of record fail to teach or fairly

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suggest the device above wherein the modulator includes a pair of current sources coupled to the differential current signal, and a pair of cross-coupled differential amplifiers, each differential amplifier coupled to a respective current source, the differential amplifiers operating to receive a carrier signal and to generate the output signal based, in part, on the carrier signal and the differential current signal.

Terminal Disclaimer

8. The terminal disclaimer filed on 12/06/2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 6,615,027 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

9. In view of the terminal disclaimer, the previous double patenting rejections have been withdrawn. However, new grounds of rejections are applied to claims 1-13, 15-18, 21-29 and 32.

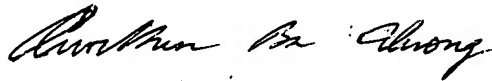
Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quochien B. Vuong whose telephone number is (571) 272-7902. The examiner can normally be reached on M-F 9:30-18:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Quochien B. Vuong
Feb. 01, 2007.

QUOCHIE B. VUONG
PRIMARY EXAMINER